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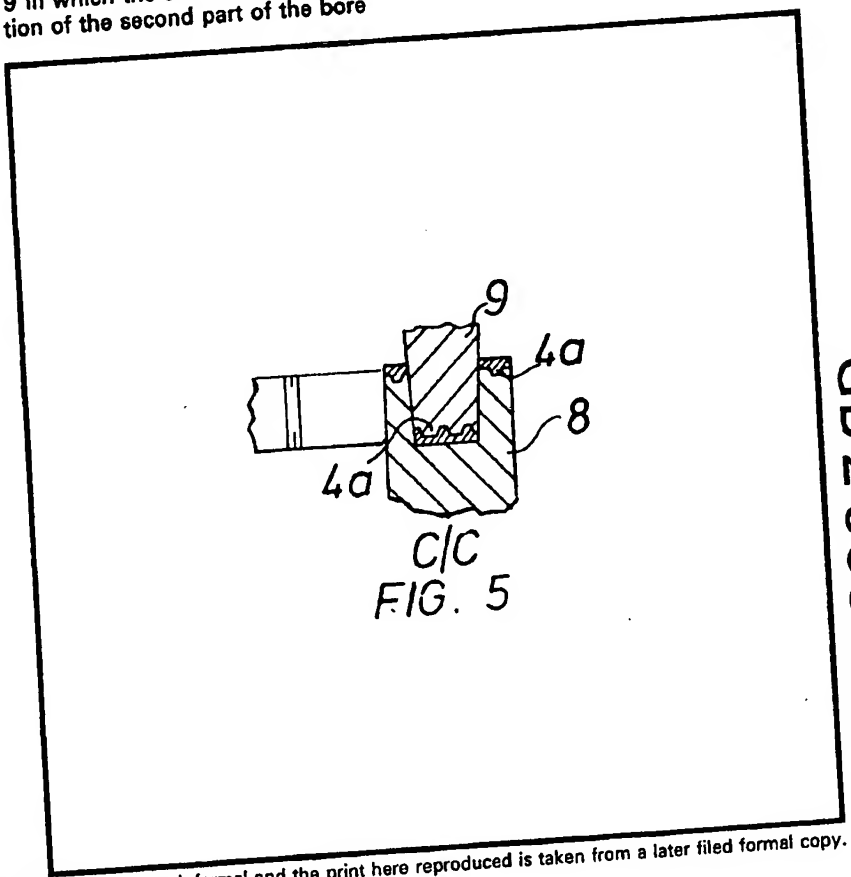
(71) Applicant
Masterplug Products
Limited
Lingford Street
Hucknall
Nottingham
NG15 7SJ
(72) Inventor
Keith Dove
(74) Agents
Eric Potter & Clarkson

(54) Plug for hollow partitioning and method of moulding

(57) A one piece moulded plug is formed of synthetic plastics material and is particularly suitable for use in connection with non-loadbearing surfaces, such as partition walls, plasterboard walls and such like. The plug comprises a first part with a bore and a second part with a bore, the second part having screw threads formed therein and two parts being interconnected by a pair of webs which in use, when the second part of the plug is brought towards collapse outwardly so locking the plug behind the partitioning means. The webs desirably have a line of weakening to assist the outward collapsing thereof and the plug is formed in a two-part die 8, 9 in which the screw threaded portion of the second part of the bore is formed from at least one die being bifurcated and with a part of the second die extending between the two limbs of the bifurcation, the two parts of the die being provided with profiles for forming the screw threaded portions making a composite second part with the screw threads formed therein.



C/C
FIG. 5

The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

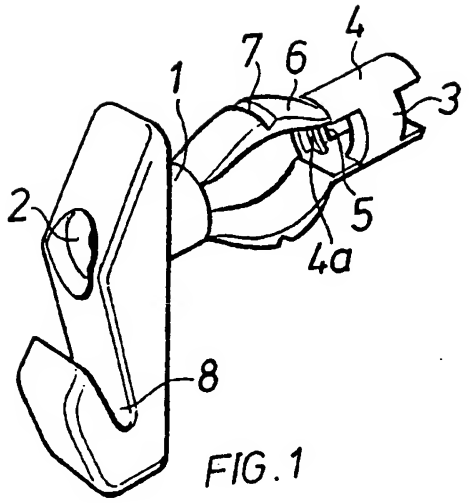


FIG.1

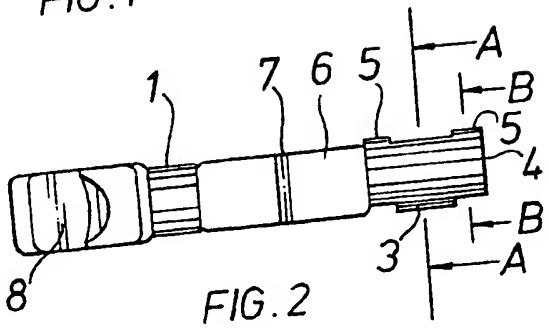
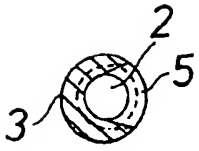
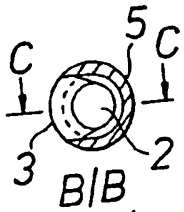


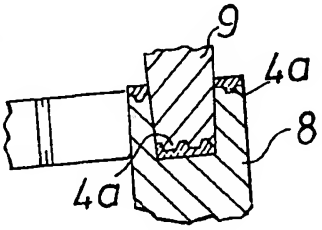
FIG.2



A|A
FIG.3



B|B
FIG.4



C|C
FIG. 5

SPECIFICATION

Plug for hollow partitioning

This invention relates to plugs especially suitable for securing articles to hollow partitioning, doors and the like.

In the specification of United Kingdom Patent No. 1,541,590, there is described a plug of a similar kind to that which the present invention relates. Plugs for receiving a screw are well known for use with load bearing construction elements such as bricks, concrete, breeze blocks and wooden partitions and such like. In many modern building constructions non-loadbearing members are used, such as partitioning walls, plaster-board ceilings and such like, and it is often desired to locate a member on the exterior surface on such non-loadbearing components. Problems arise in that a conventional plug for use in a loadbearing member is not suitable. In Specification 1,541,590 a plug is described which has three collapsible webs which are separated from a first part having a bore and a second part having a bore, such that when a screw is inserted into the first part and engaged into the second part with a bore and rotated, the second part is drawn towards the first part and the collapsible webs are collapsed outwardly and bear against the rear face of the non-loadbearing member. It has been found that by making the interior bore of the second part screw threaded or with threads in which a screw readily locates there is substantial improvement. The moulding of a thread in the bore has been found to be difficult, however, requiring a former which can be unscrewed, for example. A mould with such a former is costly both in construction and maintenance.

Accordingly the present invention provides a one-piece plug moulded of synthetic plastics material having a first part with a bore, a second part with a bore, the second part having screw threads formed within the bore and at least two collapsible webs inter-connecting the first part with the second part so that when the second part is brought towards the first part the said webs collapse outwardly.

According to one aspect of the invention, a one-piece plug is moulded in plastics material and has first and second parts each having a bore and being interconnected by at least two bendable webs such that when the second part is moved towards the first the webs bend outwardly, the bore in the second part having screw-thread portions therein, each portion being arranged opposite an aperture in the wall of the bore.

Desirably a line of weakening is formed in a portion of the webs to assist in their outward collapsing or bending. The said line of weakening may either be in the interior surface of the webs or on the interior.

According to the present invention the formation of the threaded bore within the second part is formed by a divided die in which a part of the bore is formed by one portion of the die with threaded portion formed thereon, and the other part of the bore is formed by another die with a threaded portion formed thereon, the two dies co-operating with each other like fingers operating from opposite sides; one of the die having a pair of fingers in a forked formation, and the other die having a single finger which operates between the forks of the two fingers of the other die.

Alternatively the other die may have a forked formation so that the fingers of the two dies inter-engage with each other.

The invention also provides a method of forming a one-piece plug having first and second parts each having a bore and being interconnected by at least two bendable webs such that when the second part is moved towards the first part the webs bend outwardly, the bore in the second part having screw-thread portions therein, which method comprises moulding a plastics material in a split die, the die having at least one thread-forming member extending from each part thereof arranged to mould a screw-thread portion in the bore of the second part and being located such that when the die parts are separated after moulding the thread-forming members are withdrawn transversely from the second part of the plug through apertures formed thereby in the wall of said second part.

In order that the present invention may be more readily understood reference is now made to the accompanying drawings in which:

Figure 1 is a perspective view of a plug according to the present invention;

Figure 2 is a plan view thereof;

Figure 3 is a sectional view on the line AA of Fig. 2;

Figure 4 is a sectional view on the line BB of Fig. 3 and

Figure 5 is a sectional view on the line CC of Fig. 1.

In the figures a plug is shown which is provided with a hooked portion 8. The plug is formed of synthetic plastics material by an injection moulding process. The hook portion 8 is integrally connected to a first portion 1 of the plug which consists of a substantially cylindrical part with a bore 2. The first part 1 is connected to a second part indicated at 4 by a pair of webs 6 each of which has a line of weakness in the centre portion 7 to assist the outward bending of the web 6 about the line of weakness 7 when the second part 4 is drawn towards the first part 1. The second part 4 is also provided with a bore but this bore has screw threads formed therein as indicated at 4a in Fig. 1. The second part 4 is

formed by two opposed portions consisting of a first portion 3 and a second dual portion 5 which is formed from a die having a pair of fingers so that the portion 3 is located between the portions 5 as will become more clear with reference to Fig. 5.

From Fig. 5 it will be appreciated that the second part 4 is formed from a pair of co-operating dies. The portion 5 of Fig. 4 is formed by a single finger die 9 having co-operating screw threaded portions to form the screw threads 4a while the portions 5 are formed from a bifurcated or forked die 8 also having at its end screw threaded shapes to form the screw threaded portions 4a. It will be appreciated that the bifurcated die 8 operates either side of the single die 9 forming the part 5.

It has been found that by providing the second part 4 with a bore having screw threads that when a machine or wood screw of conventional form is inserted into the bore 2 and thence through the part 1 that the screw threads of the screw more readily bite into the screw threads formed in the second part 4 and positively urge the second part 4 towards the first part 1 and at the same time outwardly bending the webs 6 to form a positive location of the plug on a non-load-bearing surface member.

It is thought that the provision of the screw threads 4a in the second part 4 form an improvement over the provision of the plug described in British Patent Specification 1,541,590 and that by the provision of the divided bifurcated die 8 and the finger die 9 as described with reference to Fig. 5 herein, that a novel and improved method of injection moulding a plug of the aforementioned kind is provided.

CLAIMS

1. A one-piece plug moulded of synthetic plastics material having a first part with a bore, a second part with a bore, the second part having screw threads formed within the bore and at least two collapsible webs interconnecting the first part with the second part so that when the second part is brought towards the first part the said webs collapse outwardly.

2. A one-piece plug moulded in plastics material and having first and second parts each having a bore and being interconnected by at least two bendable webs such that when the second part is moved towards the first part the webs bend outwardly, the bore in the second part having screw-thread portions therein, each portion being arranged opposite an aperture in the wall of the bore.

3. A plug according to Claim 1 or 2, in which the webs are provided with a line of weakening substantially mid-way between the first and second part to assist the outward collapsing thereof.

4. A plug according to Claim 3, in which the line of weakening consists of a cut or the like formed in the exterior surface of the webs.

5. A plug according to Claim 3, in which the line of weakening consists of a cut or the like formed on the interior surface of the webs.

6. A method of forming a plug of the kind claimed in any of the Claims 1 to 5, which comprises moulding the plug from synthetic plastics material in a divided die, having a first portion of the die in the form of a finger with a threaded portion formed thereon, and the other part of the bore being formed from a die with a bifurcated portion with threaded parts of the bore provided thereon, extending the finger extended between the bifurcated portion of the die to form a composite die in which the second part of the plug having the bore with screw threads provided therein is moulded.

7. The method according to Claim 6, in which both parts of the divided die are bifurcated, one of the limbs of each bifurcation extending between the two limbs of the other die and each of the two bifurcated portions of the die having screw threaded portions formed thereon to form the screw threaded portions of the second part of the said plug.

8. A method of forming a one-piece plug having first and second parts each having a bore and being interconnected by at least two bendable webs such that when the second part is moved towards the first part the webs bend outwardly, the bore in the second part having screw-thread portions therein, which method comprises moulding a plastics material in a split die, the die having at least one thread-forming member extending from each part thereof arranged to mould a screw-thread portion in the bore of the second part and being located such that when the die parts are separated after moulding the thread-forming members are withdrawn transversely from the second part of the plug through apertures formed thereby in the wall of said second part.

9. The method of forming a plastics plug substantially as described herein with reference to the accompanying drawings.

10. A one-piece plug moulded of plastics material substantially as described and illustrated herein with reference to the accompanying drawings.

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